



Diesel engines with Multijet II technology

A real pioneer in the development of new technologies applied to diesel engines, the Powertrain division of the FCA Group first introduced Multijet II engines with third-generation Common Rail injection system in 2009. It was an important milestone and yet another leading innovation after the JTD engines in 1997 and Multijet engines in 2003.

The secret of the Multijet II system lies in the new injectors which can control the amount of fuel injected into the combustion chamber very accurately, in a particularly quick and flexible injection sequence by using balanced hydraulic servo valves. Up to eight injections per cycle can be controlled and increasingly advanced strategies for optimising combustion can be implemented, such as Injection Rate Shaping (IRS), in which the two consecutive main injections are so close that they generate a continuous, modulated fuel delivery profile in the cylinders. This improves the combustion process ensuring noiseless operation and low polluting emissions. In addition, the injection system is made even simpler and more reliable thanks to a less complex injector construction.

Today, Jeep Grand Cherokee, Jeep Cherokee and Jeep Renegade fit diesel engines with Multijet II technology. The diesel engine offering on the new Jeep Compass comprises the efficient 1.6-litre Multijet II with Stop&Start, delivering 120 HP of power at 3,750 rpm and 320 Nm of torque at 1,750 rpm, paired to the six-speed manual transmission, and the 2.0-litre Multijet II, delivering 140 HP at 1,750 rpm with the six-speed manual transmission – with torque of 350 Nm at 1,750 rpm. A more powerful version of the 2-litre



Multijet II with Stop&Start, capable of delivering 170 HP paired with the nine-speed automatic transmission, is also available.

Petrol engines with MultiAir technology

MultiAir is the revolutionary technology applied to petrol engines developed by the Powertrain division of the Group. When it was introduced in 2009 it was heralded as a major “generational leap” and an extraordinary result achieved by capitalising on the pioneering spirit of Powertrain. The forerunner of the new MultiAir family was the 1.4 litre engine fitted on the Alfa Romeo Mito.

Winner of the “International Engine of the Year” competition in 2010 and gradually fitted on FCA models, the MultiAir engine is a concentrate of entirely Italian made innovation and creativity, which secures practical and immediately perceivable advantages in everyday use: more peak engine power (up to 10%) and more torque at low rpm (up to 15%). At the same time, fuel consumption and CO₂ emissions are cut by 10% (compared to traditional engines) by eliminating pumping losses. Furthermore, polluting emissions are significantly reduced as a result of the engine warm-up control strategies and the exhaust gas recirculation.

The heart of the MultiAir is the electro-hydraulic valve management system which directly controls the intake air and improves the engine dynamic response. In particular, this technology manages intake valve opening and timing, cylinder by cylinder, in flexible and independent manner without using the throttle. The result is fuel-efficiency and lower emissions, with no



effects on performance. On the contrary, the intrinsic sprightliness of petrol engines, deriving from smooth combustion and their light-weight structure and components, are enhanced.

MultiAir is available on Jeep Cherokee and Jeep Renegade since 2014. The new Jeep Compass will be the third Jeep model to be equipped with second generation MultiAir2 petrol engines. More specifically, the engine line-up comprises the 1.4-litre MultiAir2 Turbo with Stop&Start, delivering 140 HP of power at 5,000 rpm and 230 Nm of torque at 1,750 rpm, paired with a six-speed manual transmission, and the 1-4-litre MultiAir2 Turbo, delivering 170 HP at 5,500 rpm and 250 Nm of torque at 2,500 rpm, paired with nine-speed automatic transmission.



Nine-speed automatic transmission

The nine-speed automatic transmission fitted on the new Compass ensures remarkably smooth shifting, an extremely wide range of transmission speeds to guarantee the best acceleration, low emissions and better fuel efficiency.

The nine-speed gearbox guarantees adequate response to all driving situations: aggressive launches and smooth, efficient power delivery at highway speeds. The transmission offers prompt response, fast acceleration and smooth shifting. The wide opening range of the transmission provides a vigorous first ratio for better performance also in lower gears. The short excursions between gears guarantee smoother shifting from one to the next.



The fully electronic, nine-speed automatic transmission features the on-the-fly shift-map changing with Auto Stick manual shift capability. Over 40 individual mappings optimise shifting quality to improve fuel efficiency, performance and driving pleasure.

The sophisticated transmission software relies on many input parameters – such as torque, kick-down, longitudinal and lateral acceleration and changes of gradient – to determine the appropriate driving conditions and adjusts shift pattern in response to these driving conditions to offer the best possible fuel economy, emissions and drivability balance. For added driving comfort, additional parameters have been integrated in the transmission control strategy, such as temperature, speed and electronic stability control. The result is automatic shifting ideally attuned to the performance requirements of almost any driving demand.

By operating at low rpm on the urban and highway cycles, the automatic transmission guarantees increased fuel efficiency by means of the difference between the various gears and the mechanical efficiency values.

The addition of a higher number of gear contributes to decreasing the perceived change of speed normally associated to gear shifts. Gear changes are nearly imperceptible due to the evenly spaced gear steps between each gear ratio. Internally the transmission has four gear sets and six shift elements – multi-disc clutches, dog clutches and brake clutches. Reduced drag losses with three of six clutches open in any gear equates to improved fuel efficiency.



Press Information

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The nine-speed transmission is developed in partnership with ZF and built at the FCA plant in Kokomo, Indiana (USA) specifically to be fitted on 4WD transverse engine models.

ENDS

Notes to Editors

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